AMENDMENTS TO THE CLAIMS

This listing of claims replaces all prior versions, and listings, of claims in the application.

1. (Currently Amended) A high-throughput method of distinguishing at least two molecules simultaneously ~~one molecule individually~~ in a sample comprising multiple molecules, said method comprising:

(i) subjecting a sample comprising multiple molecules, at least two molecules ~~one molecule~~ of which is detectably labeled, to electrophoresis, wherein said multiple molecules in said sample are not amplified prior to being subjected to electrophoresis,

(ii) imaging the electrophoretic mobility of the at least two ~~one~~ detectably labeled molecules ~~molecule~~ over time by detecting the position of the detectable label of the at least two ~~one~~ detectably labeled molecules ~~molecule~~ over time and, optionally, at the same time, dispersing the image by a transmission grating for spectroscopic analysis, and

(iii) determining the electrophoretic mobility of the at least two ~~one~~ detectably labeled molecules ~~molecule~~ and, optionally, determining the molecular spectrum of the at least two ~~one~~ detectably labeled molecules ~~molecule~~, thereby distinguishing at least two molecules ~~one molecule~~ individually in a sample comprising multiple molecules.

2. (Cancelled)

3. (Currently Amended) The high-throughput method of claim 1, wherein said at least two molecules are ~~one molecule is a~~ nucleic acids ~~acid~~.

4. (Currently Amended) The high-throughput method of claim 3, wherein each ~~said~~ nucleic acid is detectably labeled with a fluorescent label.

5. (Currently Amended) The high-throughput method of claim 1, wherein said at least two molecules are proteins ~~one molecule is a protein~~.

6. (Currently Amended) The high-throughput method of claim 5, wherein each ~~said~~ protein is detectably labeled with a fluorescent label.

7. (Currently Amended) The high-throughput method of claim 1, wherein said at least two molecules are ~~one molecule is a~~ small molecules ~~molecule~~.

8. (Currently Amended) The high-throughput method of ~~any of~~ claim 1, wherein said sample comprises a buffer.

9. (Original) The high-throughput method of claim 8, wherein said buffer is photobleached.

10. (Original) The high-throughput method of claim 8, wherein said buffer comprises a sieving matrix.

11. (Currently Amended) The high-throughput method of claim 1, wherein said at least two molecules are ~~one molecule is~~ detectably labeled with a fluorescent label and said fluorescent label is induced to fluoresce by a laser.

12. (Previously Presented) The high-throughput method of claim 11, wherein fluorescence from said fluorescent label is focused on an imaging means.

13. (Previously Presented) The high-throughput method of claim 12, wherein said imaging means is an intensified CCD camera.

14. (Previously Presented) The high-throughput method of claim 12, wherein said laser generates extraneous light and said extraneous light is eliminated through the use of an equilateral prism and at least one optical pinhole positioned before said imaging means.

15. (Previously Presented) The high-throughput method of claim 12, wherein one or more optical filters are positioned in front of said imaging means.

16. (Previously Presented) The high-throughput method of claim 1, wherein said electrophoretic mobility is measured by a method selected from the group consisting of the multiframe method, the streak method and the multispot method.

17. (Previously Presented) The high-throughput method of claim 1, wherein said electrophoretic mobility is imaged in less than about 5 milliseconds.

18. (Currently Amended) The high-throughput method of claim 1, wherein each of the at least two ~~one~~ detectably labeled molecules are ~~molecule~~ is present in said sample at a concentration of at least about 1 copy per millilter.

19. (Previously Presented) The high-throughput method of claim 1, wherein at least about 200 detectably labeled molecules are imaged every 10 milliseconds.

20. (Original) The high-throughput method of claim 19, wherein at least about 2,500 detectably labeled molecules are imaged every 25 milliseconds.

21. (Currently Amended) A system for use in the method of claim 1, said system comprising:

(i) an electrophoretic sample channel, into which is introduced a sample comprising multiple molecules, at least two molecules ~~one molecule~~ of which are ~~is~~ detectably labeled with a fluorescent label, wherein said multiple molecules in said sample are not amplified prior to being introduced into the electrophoretic sample channel,

(ii) a light source comprising or consisting essentially of at least one wavelength of light that causes at least two molecules ~~one molecule~~ in said sample comprising multiple molecules that is detectably labeled with a fluorescent label to fluoresce, wherein said light source irradiates said electrophoretic sample channel,

(iii) an imaging means, wherein said imaging means images the electrophoretic mobility of the at least two ~~one~~ detectably labeled molecules ~~molecule~~ in said sample over time, and, optionally,

(iv) a transmission grating, which disperses the imaging of the electrophoretic mobility of the at least two ~~one~~ detectably labeled molecules ~~molecule~~ in said sample.

22. (Original) The system of claim 21, which further comprises a lens between said light source and said electrophoretic sample channel, wherein said lens focuses said light at normal incidence to said electrophoretic sample channel.

23. (Previously Presented) The system of claim 21, wherein said laser generates extraneous light and said system further comprises an equilateral prism and at least one optical pinhole before said imaging means, wherein said equilateral prism and said at least one optical pinhole eliminate said extraneous light prior to it impinging on said imaging means.

24.-56. (Cancelled)

57. (Previously Presented) The system of claim 22, wherein said laser generates extraneous light and said system further comprises an equilateral prism and at least one optical pinhole before said imaging means, wherein said equilateral prism and said at least one optical pinhole eliminate said extraneous light prior to it impinging on said imaging means.

58. (Previously Presented) The system of claim 21, wherein said imaging means is an intensified CCD camera.

59. (Previously Presented) The system of claim 58, which further comprises a microscope objective between said electrophoretic sample channel and said imaging means, wherein said microscope objective focuses the fluorescence from said fluorescent label onto said imaging means.

60. (Previously Presented) The system of claim 21, which further comprises one or more optical filters positioned in front of said imaging means.

61. (Previously Presented) The system of claim 22, which further comprises one or more optical filters positioned in front of said imaging means.

62. (Currently Amended) The system of claim 21, wherein said imaging means images the electrophoretic mobility of at least two ~~a~~ detectably labeled molecules ~~molecule~~ in said sample in less than about 5 milliseconds.

63. (Previously Presented) The system of claim 21, wherein said imaging means images the electrophoretic mobility of at least about 200 detectably labeled molecules every 10 milliseconds.

64. (Previously Presented) The system of claim 21, wherein said imaging means images the electrophoretic mobility of at least about 2,500 detectably labeled molecules every 25 milliseconds.

65. (Currently Amended) A high-throughput method of distinguishing at least two molecules simultaneously ~~one molecule individually~~ in a sample comprising multiple molecules, said method comprising:

(i) introducing a sample comprising multiple molecules in free solution, at least two molecules ~~one molecule~~ of which are ~~is~~ detectably labeled, into a sample channel, wherein said multiple molecules in said sample are not amplified prior to being introduced into said sample channel,

(ii) simultaneously imaging the position of the at least two ~~one~~ detectably labeled molecules ~~molecule~~ by detecting the position of the detectable label of the at least two ~~one~~ detectably labeled molecules ~~molecule~~ and dispersing the image by a transmission grating for spectroscopic analysis, and

(iii) determining the molecular spectrum of the at least two ~~one~~ detectably labeled molecules ~~molecule~~, thereby distinguishing at least two molecules simultaneously ~~one molecule individually~~ in a sample comprising multiple molecules.

66. (Cancelled)

67. (Currently Amended) The high-throughput method of claim 65, wherein said at least two molecules are nucleic acids ~~one molecule is a nucleic acid~~.

68. (Currently Amended) The high-throughput method of claim 67, wherein each ~~said~~ nucleic acid is detectably labeled with a fluorescent label.

69. (Currently Amended) The high-throughput method of claim 65, wherein said at least two molecules are proteins ~~one molecule is a protein~~.

70. (Currently Amended) The high-throughput method of claim 69, wherein each ~~said~~ protein is detectably labeled with a fluorescent label.

71. (Currently Amended) The high-throughput method of claim 65, wherein said at least two molecules are ~~one molecule is a~~ small molecules ~~molecule~~.

72. (Previously Presented) The high-throughput method of claim 65, wherein said sample comprises a buffer.

73. (Previously Presented) The high-throughput method of claim 72, wherein said buffer is photobleached.

74. (Currently Amended) The high-throughput method of claim 65, wherein said at least two molecules are ~~one molecule is~~ detectably labeled with a fluorescent label and said fluorescent label is induced to fluoresce by a laser.

75. (Previously Presented) The high-throughput method of claim 74, wherein fluorescence from said fluorescent label is focused on an imaging means.

76. (Previously Presented) The high-throughput method of claim 75, wherein said imaging means is an intensified CCD camera.

77. (Previously Presented) The high-throughput method of claim 75, wherein said laser generates extraneous light and said extraneous light is eliminated through the use of an equilateral prism and at least one optical pinhole positioned before said imaging means.

78. (Previously Presented) The high-throughput method of claim 75, wherein one or more optical filters are positioned in front of said imaging means.

79. (Previously Presented) The high-throughput method of claim 65, wherein said position is imaged in less than about 0.05 milliseconds.

80. (Previously Presented) The high-throughput method of claim 65, wherein each of the ~~said~~ at least two ~~one~~ detectably labeled molecules ~~molecule~~ is present in said sample at a concentration of at least about 1 copy per millilter.

81. (Previously Presented) The high-throughput method of claim 65, wherein at least about 200 detectably labeled molecules are imaged every 0.10 milliseconds.

82. (Previously Presented) The high-throughput method of claim 81, wherein at least about 2,500 detectably labeled molecules are imaged every 0.25 milliseconds.

83. (Previously Presented) A system for use in the method of claim 65, said system comprising:

(i) a sample channel, into which is introduced a sample comprising multiple molecules in free solution, at least two molecules ~~one molecule~~ of which are ~~is~~ detectably labeled with a fluorescent label, wherein said multiple molecules in said sample are not amplified prior to being introduced into said sample channel,

(ii) a light source comprising or consisting essentially of at least one wavelength of light that causes at least two molecules ~~one molecule~~ in said sample comprising multiple molecules that are ~~is~~ detectably labeled with a fluorescent label to fluoresce, wherein said light source irradiates said sample channel,

(iii) an imaging means, wherein said imaging means images the position of the at least two ~~one~~ detectably labeled molecules ~~molecule~~ in said sample, and,

(iv) a transmission grating, which simultaneously disperses the imaging of the position of the at least two ~~one~~ detectably labeled molecules ~~molecule~~ in said sample.

84. (Previously Presented) The system of claim 83, which further comprises a lens between said light source and said sample channel, wherein said lens focuses said light at normal incidence to said sample channel.

85. (Previously Presented) The system of claim 84, wherein said laser generates extraneous light and said system further comprises an equilateral prism and at least one optical pinhole before said imaging means, wherein said equilateral prism and said at least one optical pinhole eliminate said extraneous light prior to it impinging on said imaging means.

86. (Previously Presented) The system of claim 83, wherein said imaging means is an intensified CCD camera.

87. (Previously Presented) The system of claim 86, which further comprises a microscope objective between said sample channel and said imaging means, wherein said microscope objective focuses the fluorescence from said fluorescent label onto said imaging means.

88. (Previously Presented) The system of claim 83, which further comprises one or more optical filters positioned in front of said imaging means.

89. (Previously Presented) The system of claim 83, wherein said imaging means images the position of at least two ~~a~~ detectably labeled molecules ~~molecule~~ in said sample in less than about 0.05 milliseconds.

90. (Previously Presented) The system of claim 83, wherein said imaging means images the position of at least about 200 detectably labeled molecules every 0.10 milliseconds.

91. (Previously Presented) The system of claim 83, wherein said imaging means images the position of at least about 2,500 detectably labeled molecules every 0.25 milliseconds.